Title: Concentration growth of luminescence intensity of phosphor $Zn_{2-2x}Mn_{2x}SiO_4$ ($x \leq 0.13$): Crystal-chemical and quantum-mechanical justification

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Concentration growth of luminescence intensity of phosphor $Zn_{2-2x}Mn_{2x}SiO_4$ ($x \leq 0.13$): crystal-chemical and quantum-mechanical justification

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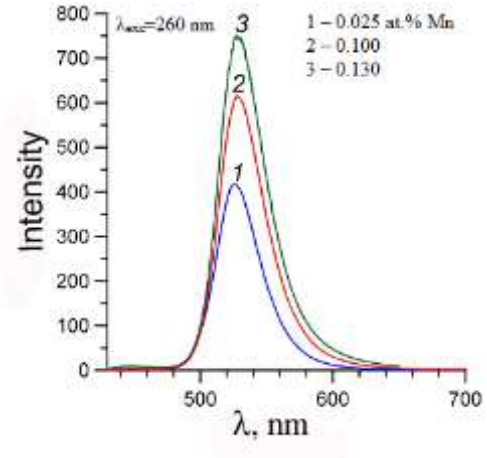
Graphical abstract



Highlights

Willemite-based $Zn_{2-2x}Mn_{2x}SiO_4$ solid solution was produced by solid-state reaction.

Mn atoms are present as individual Mn^{2+} ions hosted within tetrahedral crystal field.

Stochastic distribution of Mn atoms is registered.

Luminescence intensity is maximal for $Zn_{1.74}Mn_{0.26}SiO_4$ upon increase of Mn content.